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L3: Entry 1 of 5

File: USPT

Nov 25, 2003

DOCUMENT-IDENTIFIER: US 6654807 B2
TITLE: Internet content delivery network

Detailed Description Paragraph Equation (5):

http://<repeater>/<server>@proxy=<scheme>:<type> @/ <path> This URL is interpreted when received by the repeater. The reflector then sends (B3-3) a REDIRECT reply containing this new URL to the requesting client. The HTTP REDIRECT command allows the reflector to send the browser a single URL to retry the request. B4. To serve a request locally, the request is sent by the reflector to ("forwarded to") the origin server 102. In this mode, the reflector acts as a reverse proxy server. The origin server 102 processes the request in the normal manner (A5-A7). The reflector then obtains the origin server's reply to the request which it inspects to determine if the requested resource is an HTML document, i.e., whether the requested resource is one which itself contains resource identifiers. B5. If the resource is an HTML document then the reflector rewrites the HTML document by modifying resource identifiers (URLs) within it, as described below. The resource, possibly as modified by rewriting, is then returned in a reply to the requesting client 106. If the requesting client is a repeater, the reflector may temporarily disable any cache-control modifiers which the origin server attached to the reply. These disabled cache-control modifiers are later re-enabled when the content is served from the repeater. This mechanism makes it possible for the origin server to prevent resources from being cached at normal proxy caches, without affecting the behavior of the cache at the repeater. B6. Whether the request is reflected or handled locally, details about the transaction, such as the current time, the address of the requester, the URL requested, and the type of response generated, are written by the reflector to a local log file.

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US006654807B2

(12) **United States Patent**
Farber et al.

(10) **Patent No.:** **US 6,654,807 B2**
(45) **Date of Patent:** **Nov. 25, 2003**

(54) **INTERNET CONTENT DELIVERY NETWORK**

(75) Inventors: **David A. Farber**, Oak View, CA (US); **Richard E. Greer**, Red Lodge, MT (US); **Andrew D. Swart**, Westlake Village, CA (US); **James A. Balter**, Santa Barbara, CA (US)

(73) Assignee: **Cable & Wireless Internet Services, Inc.**, San Francisco, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/004,430**

(22) Filed: **Dec. 6, 2001**

(65) **Prior Publication Data**

US 2002/0049857 A1 Apr. 25, 2002

Related U.S. Application Data

(63) Continuation of application No. 09/612,598, filed on Jul. 7, 2000, which is a continuation of application No. 09/021,506, filed on Feb. 10, 1998, now Pat. No. 6,185,598.

(51) **Int. Cl.** ⁷ **G06F 15/173**

(52) **U.S. Cl.** **709/225; 709/226; 709/229**

(58) **Field of Search** **709/225, 226, 709/229**

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(List continued on next page.)

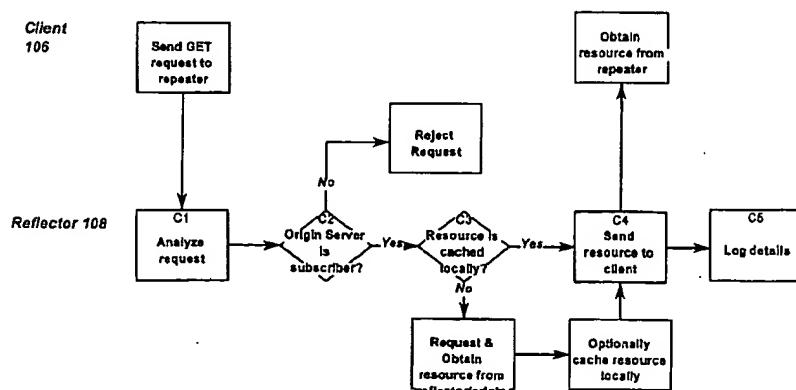
Primary Examiner—Mehmet B. Geckil

(74) *Attorney, Agent, or Firm*—Blakely Sokoloff Taylor & Zafman LLP

(57) **ABSTRACT**

Resource requests made by clients of origin servers in a network are intercepted by reflector mechanisms and selectively reflected to other servers called repeaters. The reflectors select a best repeater from a set of possible repeaters and redirect the client to the selected best repeater. The client then makes the request of the selected best repeater. The resource is possibly rewritten to replace at least some of the resource identifiers contained therein with modified resource identifiers designating the repeater instead of the origin server.

48 Claims, 6 Drawing Sheets



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L3: Entry 2 of 5

File: USPT

Jun 4, 2002

DOCUMENT-IDENTIFIER: US 6401077 B1

**** See image for Certificate of Correction ****

TITLE: Method and system for providing additional behavior through a web page

Detailed Description Text (3):

The ECE portal system can effect the intercepting of requests in several ways. In one embodiment, the ECE portal system redirects the navigation URLs of each source web page that it provides to a client computer. The ECE portal system redirects the navigation URLs by modifying the HTML document so that the URLs point to the ECE portal web site and include information for identifying the source web pages corresponding to the URL before being redirected. When a user selects a redirected URL, the navigation request is sent to the ECE portal system. When the ECE portal system receives the request, it retrieves the source web page that corresponds to the URL before being redirected and then redirects the navigation URLs in that newly-retrieved source web page. The ECE portal system may also augment that source web page with additional behavior before sending the web page to the client computer. In this way, the ECE portal system can intercept the navigation requests of a source web page and augment the source web pages before providing them to a client computer.

Detailed Description Text (4):

The redirecting of the navigation URLs by modifying the HTML document that represents a web page may not effect the redirecting of some URLs that are dynamically generated when the browser processes the web page. Relative URLs that are dynamically generated can, however, be redirected. When a relative URL is dynamically generated, it is routed to the server of the web page in which the URL is embedded. Since the embedding web page is provided by the ECE portal system, the relative URLs are routed to the ECE portal system. The HTTP-request message for the relative URL also includes the complete URL of the embedding URL (also referred to as a "referring URL"). The ECE portal system can look at the embedding URL to identify the source server because the identification of the source server was included when the ECE portal system redirected the navigation URL to that web page. The ECE portal system can then instruct the browser to redirect the relative URL to the source server. When the ECE redirects the static navigation URLs of a web page, it can place a special flag in each URL to indicate that the URL has been redirected. In this way, the ECE portal system can distinguish redirected URLs that it receives from dynamically generated relative URLs so that the relative URLs can be identified and redirected. Two alternate ways of redirecting the navigation URLs defer the redirecting until after URLs are dynamically generated can effect the redirecting of all URLs. In one embodiment, the ECE portal system installs an URL intercepting component on the client computer. Whenever the browser sends a navigation request, the URL intercepting component receives the request and redirects the request to the ECE portal system. Alternately, the ECE portal system can configure the browser of the client computer so that the ECE portal web site acts as a proxy server for the browser. When acting as a proxy server, the ECE portal web site receives all navigation requests from the browser. With deferred redirecting, the ECE portal system receives all navigation requests, even absolute URLs that are generated dynamically, and can augment the requested web pages before providing them to the client computer.

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US006401077B1

(12) **United States Patent**
Godden et al.

(10) **Patent No.:** US 6,401,077 B1
(45) **Date of Patent:** Jun. 4, 2002

(54) **METHOD AND SYSTEM FOR PROVIDING ADDITIONAL BEHAVIOR THROUGH A WEB PAGE**

(75) Inventors: **Glenn Godden; John Guthrie**, both of Seattle, WA (US)

(73) Assignee: **Network Commerce, Inc.**, Seattle, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/322,963**

(22) Filed: **May 28, 1999**

(51) Int. Cl.⁷ **G06F 17/60; G06F 15/16; G06F 15/00; G06F 17/00; G06F 17/21**

(52) U.S. Cl. **705/26; 705/27; 707/513; 709/217; 709/219**

(58) Field of Search **705/1, 26, 27; 707/501, 513; 709/217, 218, 219**

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709/218

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Primary Examiner—Wynn Coggins

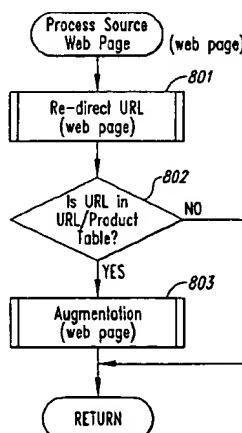
Assistant Examiner—Nicholas David Rosen

(74) Attorney, Agent, or Firm—Perkins Coie LLP

(57) **ABSTRACT**

A method and system for enabling a page description provided by a source server to perform additional behavior provided by a portal server. The page description (e.g., an HTML document) is associated with one or more items (e.g., a product). The enabling system executes at the portal server and receives a selection of the page description (e.g., a URL) from a client computer. The enabling system then retrieves from the source server the selected page description. The enabling system adds to the retrieved page description a user interface element that describes an action to be performed so that the additional behavior (e.g., placing an order for the product) can be performed for the associated item. The enabling system may also redirect to the portal server the navigation references of the retrieved page description so that all navigation based on the page description is routed through the portal server. When the enabling system intercepts these redirected navigation references, it can then retrieve and enable the referenced page description.

18 Claims, 9 Drawing Sheets



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L3: Entry 3 of 5

File: USPT

Feb 6, 2001

DOCUMENT-IDENTIFIER: US 6185598 B1
TITLE: Optimized network resource location

Detailed Description Text (47):

B5. If the resource is an HTML document then the reflector rewrites the HTML document by modifying resource identifiers (URLs) within it, as described below. The resource, possibly as modified by rewriting, is then returned in a reply to the requesting client 106.

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US006185598B1

(12) **United States Patent**
Farber et al.

(10) **Patent No.:** US 6,185,598 B1
(45) **Date of Patent:** Feb. 6, 2001

(54) **OPTIMIZED NETWORK RESOURCE LOCATION**

(75) Inventors: David A. Farber, Oak View, CA (US); Richard E. Greer, Red Lodge, MT (US); Andrew D. Swart, Westlake Village; James A. Balter, Santa Barbara, both of CA (US)

(73) Assignee: Digital Island, Inc., San Francisco, CA (US)

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

(21) Appl. No.: 09/021,506

(22) Filed: Feb. 10, 1998

(51) Int. Cl. 7 G06F 15/16; G06F 13/00

(52) U.S. Cl. 709/200; 709/203; 709/226; 709/233; 709/234; 709/235; 709/236; 709/237; 709/239; 709/240; 709/241

(58) Field of Search 709/200, 203, 709/223, 224, 226, 233, 234, 235, 238, 239, 240, 241

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Primary Examiner—Zarni Maung

Assistant Examiner—Almari Romero

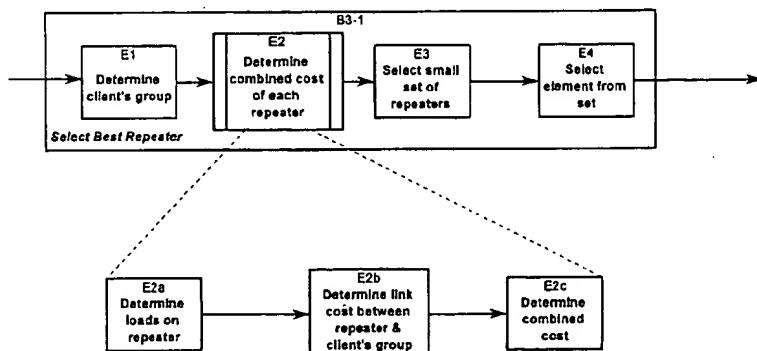
(74) Attorney, Agent, or Firm—IP Group of Pillsbury Madison & Sutro LLP

(57) **ABSTRACT**

Resource requests made by clients of origin servers in a network are intercepted by reflector mechanisms and selectively reflected to other servers called repeaters. The reflectors select a best repeater from a set of possible repeaters and redirect the client to the selected best repeater. The client then makes the request of the selected best repeater. The resource is possibly rewritten to replace at least some of the resource identifiers contained therein with modified resource identifiers designating the repeater instead of the origin server.

27 Claims, 6 Drawing Sheets

Reflector 108



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L3: Entry 4 of 5

File: USPT

Apr 18, 2000

DOCUMENT-IDENTIFIER: US 6052730 A

TITLE: Method for monitoring and/or modifying web browsing sessions

Abstract Text (1):

A method for transparently monitoring and/or modifying web browsing activities over an entire computer network does not require modification of client software and can be implemented on a single server. By rerouting HTTP requests through a centralized gateway server, the sequence and timing of URLs accessed by individual clients are recorded, providing the full information required to recreate a user session. The client HTTP requests are rerouted through the gateway server by modifying URLs within HTML documents. For each document sent to the client, any original URL which points to another server is modified so that it points to a CGI script program on the gateway. The gateway server then fetches the requested document from the other server, modifies the URLs within the document, and passes it on to the client. Thus, subsequent requests from the client will automatically be directed through the gateway server. The method permits tracking individual web sessions and provides valuable information about user behavior. This information can be used for general purpose evaluation of web-based user interfaces to information systems. The technique can also be used to modify a browsing experience by layering or stripping hypertext content or functionality.

Brief Summary Text (13):

(e) modifying the HTML document such that original URLs within the document are changed to new URLs, wherein the new URLs point to the first HTTP server and include the original URLs as parameters; and

Detailed Description Text (31):

It should be noted that, the present method of routing all HTTP requests through lamprey is almost entirely transparent to the client. The advantage of this transparency is that users are not required to alter their natural browsing behavior, and the browsing has the same look and feel as if it were not passing through lamprey. Because users who view the URL addresses displayed in their browsers will notice that they are all being directed toward the lamprey server, the users can always detect the fact that their browsing is passing through the lamprey server, and can easily break out of lamprey by manually entering a new URL that points directly to a different web site. In order to alert the users to the fact that the HTTP requests are passing through the lamprey server, the CGI script program can modify each HTML document so that, when rendered by the client browser, it will display to the user a notice that the session is being monitored, e.g. a "(L)" can be prepended to the title of each document that passes through lamprey, and a small header line containing an announcement that the session is being tracked and a URL of the tracking server. Various other techniques can be used to alert the user as well. Such notification is optional.

CLAIMS:

1. A method implemented on a first HTTP server machine for processing HTTP requests from an HTTP client machine, the method comprising:

- (a) receiving an HTTP request from the client;
- (b) parsing the request to identify a URL parameter pointing to a second HTTP server machine, wherein the second HTTP server machine is distinct from the first HTTP server machine;
- (c) retrieving from the second server machine an HTML document associated with the URL;
- (d) modifying the HTML document such that original URLs within the document are changed to new URLs, wherein the new URLs point to the first HTTP server machine and include the original URLs as parameters; and
- (e) sending the modified HTML document to the client.

12. A method implemented on a first HTTP gateway server machine for processing HTTP requests from an HTTP client machine, the method comprising:

- (a) receiving at the first gateway server machine an HTTP request from the client;
- (b) parsing the request to identify a URL parameter pointing to a third HTTP server machine;
- (c) retrieving from the third server machine an HTML document associated with the URL;
- (d) modifying the HTML document such that original URLs within the document are changed to new URLs, wherein the new URLs point to a second HTTP server machine and include the original URLs as parameters; and
- (e) sending the modified HTML document to the client.

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US006052730A

United States Patent [19]

Felciano et al.

[11] Patent Number: 6,052,730

[45] Date of Patent: Apr. 18, 2000

[54] METHOD FOR MONITORING AND/OR MODIFYING WEB BROWSING SESSIONS

5,892,919 4/1999 Nielsen 395/200.58

[75] Inventors: **Ramon M. Felciano, Palo Alto; Russ B. Altman, Menlo Park, both of Calif.**

Primary Examiner—Zarni Maung

Assistant Examiner—Saleh Najjar

Attorney, Agent, or Firm—Lumen Intellectual Property Services

[73] Assignee: **The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.****[57] ABSTRACT**

[21] Appl. No.: 09/004,584

A method for transparently monitoring and/or modifying web browsing activities over an entire computer network does not require modification of client software and can be implemented on a single server. By rerouting HTTP requests through a centralized gateway server, the sequence and timing of URLs accessed by individual clients are recorded, providing the full information required to recreate a user session. The client HTTP requests are rerouted through the gateway server by modifying URLs within HTML documents. For each document sent to the client, any original URL which points to another server is modified so that it points to a CGI script program on the gateway. The gateway server then fetches the requested document from the other server, modifies the URLs within the document, and passes it on to the client. Thus, subsequent requests from the client will automatically be directed through the gateway server. The method permits tracking individual web sessions and provides valuable information about user behavior. This information can be used for general purpose evaluation of web-based user interfaces to information systems. The technique can also be used to modify a browsing experience by layering or stripping hypertext content or functionality.

[22] Filed: Jan. 9, 1998

Related U.S. Application Data

[60] Provisional application No. 60/035,294, Jan. 10, 1997.

[51] Int. Cl.⁷ G06F 15/173

[52] U.S. Cl. 709/225; 709/203; 709/217; 709/219; 709/224; 709/246

[58] Field of Search 395/200.93, 200.47, 395/200.49, 200.54, 200.55, 200.59, 200.76; 709/203, 217, 219, 224, 225, 246

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12 Claims, 2 Drawing Sheets

